

Appl. No. 10/789093

In the Claims:

Listing of all claims:

1 1. (Currently Amended) A method of MIG welding
2 comprising:

3 providing ac power to a weld, wherein the ac power
4 has a negative portion and a positive portion, and the ac
5 power further has a frequency;

6 wherein the negative portion is greater than the
7 positive portion;

8 wherein the frequency is at least 60 Hz; and
9 providing a weld path on at least one workpiece,
10 wherein the weld path includes a groove having an angle of
11 less than 50 degrees.

1 2. (Original) The method of claim 1, wherein the
2 frequency is between 90 Hz and 120 Hz.

1 3. (Original) The method of claim 1, further
2 including providing a consumable, flux-cored, wire to the weld.

1 4. (Original) The method of claim 1, further
2 including providing a consumable, metal-cored, wire to the weld.

1 5. (Original) The method of Claim 4, wherein
2 providing the wire includes providing a wire wherein the wire
3 comprises a sheath encapsulating a core having a core
4 composition, the core composition comprising a combination of
5 graphite and one or more compounds of potassium, the combination
6 of graphite and compounds of potassium in the core composition
7 not exceeding approximately 5% by weight.

Appl. No. 10/789093

1 6. (Original) The method of Claim 5, wherein
2 providing the wire includes providing the wire electrode wherein
3 the one or more compounds of potassium comprise K₂MnTiO₄.

1 7. (Previously Presented) The method of Claim 6,
2 wherein providing includes providing the wire wherein the
3 combination is selected from the range from about 0.3% to about
4 .5.0% by weight.

8. (Cancelled.)

1 9. (Original) The method of claim 1, further
2 comprising providing a weld path on at least one workpiece,
3 wherein the weld path includes a groove having an angle of less
4 than 30 degrees.

1 10. (Original) The method of claim 1, further
2 comprising providing a weld path on at least one workpiece,
3 wherein the weld path includes a groove having an angle of
4 between 20 degrees and 30 degrees.

1 11. (Original) The method of claim 1, including
2 welding at a rate of at least 35 pounds per hour using a single
3 arc.

1 12. (Original) The method of claim 11 including
2 welding at a rate of at least 40 pounds per hour.

1 13. (Original) The method of claim 11 wherein the
2 negative portion is at least twice the positive portion.

1 14. (Original) The method of claim 10 wherein the
2 negative portion is at least 1.5 times the positive portion.

Appl. No. 10/789093

1 15. (Original) The method of claim 1 wherein the
2 weld process begins with a first negative portion having a
3 duration of at least 0.5 seconds.

1 16. (Original) The method of claim 14 wherein the
2 weld process begins with a first negative portion having a
3 duration of at least 0.75 seconds.

1 17. (Original) The method of claim 1 further
2 including providing a stick-out of about 2 inches.

1 18. (Original) The method of claim 17 further
2 comprising providing a shielding gas at a rate of at least 80
3 cubic feet per hour.

1 19. (Previously Presented) A method of MIG
2 welding comprising:
3 providing ac power to a weld, wherein the ac power
4 has a negative portion and a positive portion, and the ac
5 power further has a frequency of between 30 Hz and 120 Hz;
6 and
7 providing at least one workpiece with a weld path
8 thereon, wherein the weld path includes a groove having an
9 angle of less than 50 degrees.

1 20. (Original) The method of claim 19, wherein
2 providing at least one workpiece includes providing the weld path
3 with the groove having the angle between 20 degrees and 30
4 degrees.

Appl. No. 10/789093

1 21. (Original) The method of claim 19, wherein
2 providing at least one workpiece includes providing the weld path
3 with the groove having the angle less than 30 degrees.

1 22. (Original) The method of Claim 21, further
2 comprising providing a wire comprising a sheath encapsulating a
3 core having a core composition, the core composition comprising a
4 combination of graphite and one or more compounds of potassium,
5 the combination of graphite and compounds of potassium in the
6 core composition not exceeding approximately 5% by weight.

1 23. (Original) The method of Claim 22, wherein
2 providing the wire includes providing the wire electrode wherein
3 the one or more compounds of potassium comprise K_2MnTiO_4 , and the
4 combination is selected from the range from about 0.3% to about
5 5.0% by weight.

24-42. (Cancelled.)

1 43. (Previously Presented) A method of MIG
2 welding comprising:

3 providing ac power to a weld, wherein the ac power
4 has a negative portion and a positive portion, and the ac
5 power further has a frequency between 30 Hz and 120Hz;

6 wherein the negative portion is greater than the
7 positive portion; and

8 wherein the weld process begins with the negative
9 portion of at least 0.5 seconds duration.

1 44. (Original) The method of claim 43 wherein the
2 weld process begins with a first negative portion having a
3 duration of at least 0.75 seconds.

Appl. No. 10/789093

45-48. (Cancelled.)

1 49. (Currently Amended) A MIG welding system
2 comprising:

3 power means for providing ac power to a weld,
4 wherein the ac power has a negative portion and a positive
5 portion, and the ac power further has a frequency; and
6 control means for controlling the power means,
7 wherein the negative portion has a negative amp-seconds and
8 the positive portion has a positive amp-seconds, wherein the
9 control means causes the negative amp-seconds to be greater
10 than the positive amp-seconds, and wherein the frequency is
11 at least 60 Hz, and wherein the weld process begins with the
12 negative portion of at least 0.5 seconds duration.

1 50. (Original) The system of claim 49, wherein the
2 control means includes means for providing the frequency to be
3 between 90 Hz and 120 Hz.

1 51. (Original) The system of claim 49, further
2 including a consumable, flux-cored, wire, disposed to be provided
3 to the weld.

1 52. (Original) The system of claim 51, wherein the
2 wire is metal-cored.

1 53. (Original) The system of claim 52, further
2 comprising a weld path on at least one work piece, wherein the
3 weld path includes a groove having an angle of less than 50
4 degrees.

1 54. (Original) The system of claim 49, further
2 comprising a weld path on at least one workpiece, wherein the

Appl. No. 10/789093

3 weld path includes a groove having an angle of less than 30
4 degrees.

1 55. (Original) The system of claim 54 wherein the
2 control means for includes means for causing the negative amp-
3 seconds to be at least twice the positive amp-seconds.

1 56. (Original) The system of claim 49 wherein the
2 control means includes means for causing the negative amp-seconds
3 to be at least 1.5 times the positive amp-seconds.

57. (Cancelled.)

1 58. (Original) The system of claim 49 wherein the
2 control means includes means for causing the weld process to
3 begin with a first cycle portion having a duration of at least
4 0.75 seconds.

59-79. (Cancelled.)

1 80. (Original) A method of controlling
2 dilution in MIG welding comprising:
3 providing ac power to a weld, wherein the ac power
4 has a negative portion and a positive portion, and the ac
5 power further has a frequency;
6 controlling the balance of the negative portion
7 and the positive portion to obtain a desired dilution.

1 81. (Original) The method of claim 80 wherein the
2 negative portion is greater than the positive portion.

1 82. (Original) The method of claim 80 wherein the
2 negative portion is less than the positive portion.